Q235A Included in 3 standards (China)

Standards
- GB/T 3091: Welded steel pipe for low pressure liquid delivery
- GB/T 3524: Hot-rolled carbon and low alloy structural steel strips
- GB/T 700: Carbon Structural Steels

Chemical composition

<table>
<thead>
<tr>
<th>Element</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>&lt; 0.22</td>
</tr>
<tr>
<td>Si</td>
<td>&lt; 0.35</td>
</tr>
<tr>
<td>Mn</td>
<td>&lt; 1.4</td>
</tr>
<tr>
<td>P</td>
<td>&lt; 0.045</td>
</tr>
<tr>
<td>S</td>
<td>&lt; 0.05</td>
</tr>
<tr>
<td>Cr</td>
<td>&lt; 0.3</td>
</tr>
<tr>
<td>Ni</td>
<td>&lt; 0.3</td>
</tr>
<tr>
<td>Cu</td>
<td>&lt; 0.3</td>
</tr>
<tr>
<td>N</td>
<td>&lt; 0.008</td>
</tr>
<tr>
<td>As</td>
<td>&lt; 0.08</td>
</tr>
<tr>
<td>Fe</td>
<td>Rest</td>
</tr>
</tbody>
</table>

It's allowed to exceed N content up to 0.014% in finished products. On exceeding N for every 0.001% max P content reduces by 0.005%.

F - un killed steel
Z - killed steel
TZ - special killed steel

By agreement: Cu > 0.35

Properties

By GB/T 700-2006

For section of thickness >100mm is allowed to reduce the lower limit of strength up to 20N/mm²

- Thickness: < 16 mm:
  - Yield Strength: > 235 MPa
  - Tensile Strength: 370 - 500 MPa
  - Elongation: > 26 %

- Thickness: 16 - 40 mm:
  - Yield Strength: > 225 MPa
  - Tensile Strength: 370 - 500 MPa
  - Elongation: > 26 %

- Thickness: 40 - 60 mm:
  - Yield Strength: > 215 MPa
  - Tensile Strength: 370 - 500 MPa
  - Elongation: > 25 %

- Thickness: 60 - 100 mm:
  - Yield Strength: > 215 MPa
  - Tensile Strength: 370 - 500 MPa
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Elongation: > 24 %
Thickness: 100 - 150 mm ;
Yield Strength: > 195 MPa
Tensile Strength: 370 - 500 MPa
Elongation: > 22 %
Thickness: 150 - 200 mm ;
Yield Strength: > 185 MPa
Tensile Strength: 370 - 500 MPa
Elongation: > 21 %

Cold-bend test

Longitudinal test pieces
Thickness: < 60 mm ;
Return Bend: d=a
Thickness: 60 - 100 mm ;
Return Bend: d=2a

Transverse test pieces
Thickness: < 60 mm ;
Return Bend: d=1.5a
Thickness: 60 - 100 mm ;
Return Bend: d=2.5a

By GB/T 3524
Yield Strength: > 235 MPa
Tensile Strength: 375 - 500 MPa
Elongation: > 26 %
Return Bend: d=a

By GB/T 3091
Wall thickness: < 16 mm ;
Yield Strength: > 235 MPa
Tensile Strength: > 370 MPa
Wall thickness: > 16 mm ;
Yield Strength: > 225 MPa
Tensile Strength: > 370 MPa

Elongation
Outside diameter: < 168.3 mm ;
Elongation: > 15 %
Outside diameter: > 168.3 mm ;
Elongation: > 20 %